Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-18. (Canceled).

19. (New) A decoder of binary arithmetic code comprising:

a memory for storing probability estimate values of arithmetic code that are necessary for decoding;

an arithmetic code decoder for using said probability estimate values to decode binary arithmetic code that is received as input to obtain binary symbols;

a buffer for accumulating said binary symbols that have been decoded;

a first data decoder for extracting said binary symbols from said buffer to decode said binary symbols and obtain output data; and

a second data decoder for, based on said binary symbols that have been decoded, decoding data that are necessary for stream grammar analysis and updating said probability estimate values.

20. (New) A decoder of arithmetic code comprising:

a memory for storing probability estimate values of arithmetic code that are necessary for decoding;

an arithmetic code decoder for using said probability estimate values to decode multivalued arithmetic code that is received as input to obtain multivalued symbols;

a buffer for accumulating said multivalued symbols that have been decoded;

a first data decoder for extracting multivalued symbols from said buffer to decode said multivalued symbols and obtain output data; and

a second data decoder for, based on said multivalued symbols that have been decoded, decoding data that are necessary for stream grammar analysis and updating said probability estimate values.

21. (New) An encoder of binary arithmetic code, comprising:

a binarization unit for converting binary arithmetic code that has been received as input to binary symbols;

a buffer for accumulating said binary symbols;

an arithmetic encoder for extracting binary symbols from said buffer to generate arithmetic code; and

a bit number estimation unit for estimating the relation between the number of binary symbols and the number of code bits from the number of binary symbols that have been extracted by said arithmetic encoder and the number of code bits that have been generated, and for estimating the number of code bits that are generated after arithmetic encoding from the amount of accumulation of said buffer.

22. (New) An encoder of arithmetic code, comprising:

a multivalue conversion unit for converting multivalued arithmetic code that has been received as input to multivalued symbols;

a buffer for accumulating said multivalued symbols;

an arithmetic encoder for extracting multivalued symbols from said buffer and generating arithmetic code; and

a bit number estimation unit for estimating the relation between the number of multivalued symbols and the number of code bits from the number of multivalued symbols that have been extracted by said arithmetic encoder and the number of code bits that have been generated, and for estimating the number of code bits that are generated after arithmetic encoding from the amount of accumulation of said buffer.

23. (New) A method of decoding binary arithmetic code in a decoder that includes a buffer for accumulating binary symbols that have been decoded; said method comprising:

an arithmetic code decoding step of using a probability estimate values to decode binary arithmetic code that is received as input to obtain binary symbols; and

a first data decoding step of extracting said binary symbols from said buffer to decode said binary symbols and obtain output data; and

a second data decoding step of, based on said binary symbols that have been decoded, decoding data necessary for stream grammar analysis and updating said probability estimate values.

24. (New) A method of decoding arithmetic code in a decoder that includes a buffer for accumulating decoded multivalued symbols; said method comprising:

an arithmetic code decoding step of using a probability estimate values to decode multivalued arithmetic code that is received as input to obtain multivalued symbols;

a first data decoding step of extracting said multivalued symbols from said buffer to decode said multivalued symbols and obtain output data; and

a second data decoding step of, based on said multivalued symbols that have been decoded, decoding data that are necessary for stream grammar analysis and updating said probability estimate values.

25. (New) A method of encoding binary arithmetic code in an encoder having a buffer for accumulating binary symbols that have been converted, said method comprising:

a binarization step of converting binary arithmetic code that has been received as input to binary symbols;

an arithmetic encoding step of extracting binary symbols from said buffer to generate arithmetic code; and

a bit number estimation step of estimating the relation between the number of binary symbols and the number of code bits from the number of binary symbols that have been extracted and the number of code bits that have been generated, and of estimating the number of code bits that are generated after arithmetic encoding from the amount of accumulation of said buffer.

26. (New) A method of encoding arithmetic code in an encoder having a buffer for accumulating multivalued symbols that have been converted, said method comprising:

a multivalue conversion step of converting multivalued arithmetic code that has been received as input to multivalued symbols;

an arithmetic encoding step of extracting multivalued symbols from said buffer to generate arithmetic code; and

a bit number estimation step of estimating the relation between the number of multivalued symbols and the number of code bits from the number of multivalued symbols that have been extracted and the number of code bits that have been generated, and of estimating the number of code bits that are generated after arithmetic encoding from the amount of accumulation of said buffer.

27. (New) A program for causing a computer having a buffer for accumulating binary symbols that have been decoded to execute steps, said program causing said computer to execute:

an arithmetic code decoding step of using said probability estimate values to decode binary arithmetic code that has been received to obtain binary symbols;

a first data decoding step of extracting said binary symbols from said buffer to decode binary symbols and obtain output data; and

a second data decoding step of, based on said binary symbols that have been decoded, decoding data necessary for stream grammar analysis and updating said probability estimate values.

28. (New) A program for causing a computer having a buffer for accumulating multivalued symbols that have been decoded to execute steps, said program causing said computer to execute:

an arithmetic code decoding step of using said probability estimate values to decode multivalued arithmetic code that has been received as input to obtain multivalued symbols;

a first data decoding step of extracting said multivalued symbols from said buffer to decode said multivalued symbols and obtain output data; and

a second data decoding step of, based on said multivalued symbols that have been decoded, decoding data necessary for stream grammar analysis and updating said probability estimate values.

29. (New) A program for causing a computer having a buffer for accumulating binary symbols that have been decoded to execute steps, said program causing said computer to execute:

a binarization step of converting binary arithmetic code that has been received as input to binary symbols;

an arithmetic encoding step of extracting binary symbols from said buffer to generate arithmetic code; and

a bit number estimation step of estimating the relation between the number of binary symbols and the number of code bits from the number of binary symbols that have been extracted by said arithmetic encoder and the number of code bits that have been generated, and of estimating the number of code bits that are generated after arithmetic encoding from the amount of accumulation of said buffer.

30. (New) A program for causing a computer having a buffer for accumulating multivalued symbols that have been decoded to execute steps, said program causing said computer to execute:

a multivalue conversion step of converting multivalued arithmetic code that has been received as input to multivalued symbols;

an arithmetic encoding step of extracting multivalued symbols from said buffer to generate arithmetic code; and

a bit number estimation step of estimating the relation between the number of multivalued symbols and the number of code bits from the number of multivalued symbols that have been extracted by said arithmetic encoder and the number of code bits that have been generated, and of estimating the number of code bits that are generated after arithmetic encoding from the amount of accumulation of said buffer.